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JAN 06 2006

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Federal Highway Administration
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Consultation # 2-15-1999-F-0055

Dear Mr. Deocampo:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (BO) based on our review of the proposed widening of Texas Department of Transportation's (TxDOT) U.S. 79 from Farm-to-Market Road (F.M.) 1512 to Interstate Highway (I.H.) 45 (cities of Jewett to Buffalo) in Leon County, Texas, and its effects on the endangered Navasota ladies'-tresses (*Spiranthes parksii*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended. (16 U.S.C. 1531 et seq.). Your June 22, 2005, request for formal consultation was received on June 23, 2005.

This BO is based on information provided in the April 5, 2004, biological assessment and the April 2003 Environmental Assessment (EA), both prepared by TxDOT. This BO is also based on telephone conversations and e-mails between the Service, TxDOT, and the Federal Highway Administration (FHWA), and other sources of information. A complete administrative record of this consultation is on file at this office.

Consultation History

The Service responded in a letter dated December 4, 1998, to a October 15, 1998, letter, from Hicks & Company, requesting comments on this project. General information on threatened and endangered species and wetlands were provided.

The Service responded in a letter dated January 22, 2003, to the December 18, 2002, submittal of a July 2002 EA for this project. This response concurred with TxDOT's determination that the project would not affect two endangered species, the Houston toad (*Bufo houstonensis*) and the large-fruited sand-verbena (*Abronia macrocarpa*), and requested further assessment of whether Navasota ladies'-tresses might occur in the project area.

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In a June 30, 2003, letter in response to the May 6, 2003, submittal of the April 2003 EA, the Service reiterated the need for further assessment for Navasota ladies'-tresses and coordination with the Service. On June 23, 2005, the Service received the BA. The Service concurred with initiation of formal consultation in a letter dated July 18, 2005.

BIOLOGICAL OPINION

Proposed action

TxDOT proposes widening the existing U.S. 79 roadway from a two-lane road into a four-lane, divided highway using Category 4 – Statewide Connectivity Corridor Projects funds provided by FHWA. U.S. 79 is currently the only major east-west arterial route in this region and is designated as a Texas Trunk System corridor by the Texas Transportation Commission that will provide a major highway from the Texas/Louisiana border to Austin.

The proposed project totals 10.29 miles (16.56 kilometers) in length and begins southwest of Jewett approximately 0.4 miles (0.6 kilometers) west of F.M. 1512 and ends at I.H. 45 southwest of Buffalo (Figure 1). The roadway will be widened from a two-lane roadway with a 100-foot (30-meter) right-of-way (ROW) to a four-lane roadway with two 12-foot (4-meter) lanes in each direction, with 4-foot (1-meter) inside shoulders and 10-foot (3 meter) outside shoulders on each side in rural areas. Approaching and within the City of Jewett, the roadway will include either (A) a 16-foot (5-meter) median turning lane, curb and gutter facilities, and an enclosed storm drainage; or (B) 10-foot shoulders and side drainage ditches. The total width of new ROW will vary from an average of 130 feet (40 meters) wide in rural areas, to an average of 160 feet (49 meters) or 250 feet (76 meters) (depending on the configuration) in Jewett. The maximum width of ROW is 300 feet (91 meters). In addition, crossings separated by grade (elevation) will be constructed at the Missouri Pacific Railroad line's Nucor plant entrance and the F.M. 39 intersection.

Approximately 170 acres (69 hectares) of new ROW will be acquired for the project, which includes 150 acres (61 hectares) of land primarily used for agricultural activities. Approximately 8.82 acres (3.57 hectares) will be designated as the "clear zone", a required cleared area spanning from the edge of the travel lane to 30 feet (9 meters) outside of the lane. This zone is designed to eliminate objects that may pose obstruction hazards to passing motorists.

The proposed project will require some relocation of utilities, such as electrical lines and oil and gas pipelines. The amount of relocation needed is not known at this time, and will be assessed on a case-by-case basis during the project construction. Locations of construction equipment staging areas within the ROW will be reviewed by TxDOT, and avoided in those areas of potential habitat. For staging areas outside of the ROW, the contractor will be informed of the possible existence of Navasota ladies'-tresses in the area and be advised to contact the Service if impacts are anticipated.

Navasota ladies'-tresses habitat that may occur within the ROW will become part of the new road and/or the required clear zone adjacent to the roadway. Nevertheless, TxDOT proposes to minimize impacts by preserving as much habitat outside the roadway clear zone as possible,

including retaining as much woody cover and natural topography as possible in areas of Navasota ladies'-tresses habitat. In addition, revegetation of disturbed areas will be done with native tree and shrub species where feasible and allowed by project plans.

Of the approximately 170 acres of new acquisition, approximately 11.2 acres (4.5 hectares) are post oak woodlands that will be cleared as a result of the proposed project, and approximately 0.6 acres (0.2 hectares) of post oak woodlands outside of the clear zone for construction will be avoided from damage from construction activities.

At least five intermittent streams, one wetland, and 15 jurisdictional "waters of the U.S." cross the project alignment. TxDOT proposes to span these crossings using bridges whenever feasible. If dredging or filling of any of these waters is necessary, TxDOT will contact the U.S. Army Corps of Engineers to apply for the appropriate permit.

Conservation Measures:

TxDOT asserts that the cutting of highway back slopes (the area from the center of the ditch line to the right-of-way line) through Navasota ladies'-tresses habitat would create areas with the drainage/seepage factors potentially conducive to Navasota ladies'-tresses habitation. TxDOT would monitor these areas before and after construction and if plants are found in these areas in the future, would protect them from disturbance by the placement of barriers and/or protective signing and by monitoring on a regular basis.

In a proactive effort to comply with section 7(a)(1) of the Act, TxDOT also voluntarily proposes to provide compensation for impacts to Navasota ladies'-tresses through monetary contribution to a conservation fund set up to benefit this species. This money would be used to fund habitat preservation/conservation in perpetuity through land acquisition for preserves, conservation easements, or other binding agreements for Navasota ladies'-tresses. The amount to be contributed will be calculated using a formula based on fee simple land acquisition costs. TxDOT will multiply the final number of acres impacted by the average value per acre and add an additional amount (not to exceed 15 percent) to cover indirect costs of land acquisition. Indirect costs to be covered are limited to those directly related to habitat preservation/conservation such as appraisals, legal fees, landowner contact expenses, and the expense of preserve design. To calculate land values, TxDOT will use an average assessed value per acre for undeveloped tracts similar in size to the acreage required for mitigation. TxDOT will obtain the assessed values from the county appraisal districts for Leon County just prior to the year the contribution is to be calculated and paid.

TxDOT proposes providing compensation for losses of Navasota ladies'-tresses habitat that may occur onsite by contributing money sufficient to replace one acre (0.4 hectares) of optimal habitat destroyed with one acre of known habitat, and one acre of marginal habitat destroyed with 0.5 acre (0.2 hectares) of known habitat. An additional 20 percent would be added to the total acreage figure to account for edge effects. Thus, TxDOT proposes to provide compensation for a total of 14.20 acres (5.74 hectares) of Navasota ladies'-tresses habitat: [(8.48 acres optimal habitat + ½ (6.70 acres marginal habitat)) + 20 percent]. This figure may be modified slightly

prior to construction if revisions in the final plans result in an increased or decreased area of impact but should not vary by more than 20 percent of the current amount.

The areas from the center ditch line to the ROW line within the areas delineated as habitat will be monitored by district personnel familiar with Navasota ladies'-tresses for at least five years beginning the year construction is started. In addition, the ROW will be monitored a minimum of five years beginning with the first year the conditions are appropriate to conduct surveys for Navasota ladies'-tresses, such as when the plants are blooming in known habitat nearby. This may or may not be the first year following construction initiation. If this species is discovered in the ROW, the Service will be contacted to discuss additional avoidance and minimization measures that may be possible.

Status of the species

Navasota ladies'-tresses

Species Description and Life History:

The Navasota ladies'-tresses was federally listed as endangered on May 6, 1982 (47 FR 19539). No critical habitat was designated for this species.

The Navasota ladies' tresses is an erect, slender-stemmed perennial woodland orchid that grows 8-15 inches (20-38 centimeters) tall with linear leaves that form a rosette that is present in the early- to mid-spring and again in late fall and winter, although the rosette is absent at the time of flowering. The white flowers are 0.25-inch (0.64-centimeter) long with rounded petals arranged spirally on the stalk. Each flower has a conspicuously white-tipped floral bract (leaf-like structure) at its base. The side petals, which extend past the central petal, have a distinct green stripe and the lower central petal is ragged. Buds appear in early to late October, and flowering usually occurs from mid-October to mid-November. This species is very similar to the southern slender ladies'-tresses (*Spiranthes gracilis*) and nodding ladies'-tresses (*Spiranthes cernua*) which can occur in the same area. Positive identification of Navasota ladies'-tresses can only be made during flowering.

Navasota ladies'-tresses have been found in a variety of moist sandy soils, typically within 600 feet (183 meters) of drainages where subsurface flow or seepage of water occurs seasonally (Arft and Ranker 1995) and claypans beneath the sandy or loamy soils provide relatively dependable moisture; however, some plants have been found up to 1,000 feet (305 meters) from said drainages (James Thomas, HDR and Fred Smeins, Texas A&M University [TAMU], pers. comm. 2004). Such drainages may be located in small natural openings in well-developed upland post oak (*Quercus stellata*) savanna vegetation (Poole and Riskind 1987, Service 1984, Wilson 1993) or under yaupon (*Ilex vomitoria*) canopies (James Thomas, HDR, and Fred Smeins, TAMU, pers. comm. 2004).

Navasota ladies'-tresses are slow-growing and are heavily influenced by local environmental conditions (such as seasonal rainfall) where plants may not bloom if conditions have not been favorable for forming sufficient below-ground reserves (Wilson 1993). Individual plants depend on a symbiotic relationship with soil fungi that is established before the seed germinates.

Historic and Current Distribution:

Navasota ladies' tresses are known to occur in 12 counties in Texas: Bastrop, Brazos, Burleson, Freestone, Fayette, Grimes, Jasper, Leon, Madison, Milam, Robertson, and Washington counties (TXBCD 2001, Charmaine Delmatier, Service, pers. comm. 2004). Currently, approximately 142 sites have been recorded, predominantly concentrated around southern Brazos County and central Grimes County (TXBCD 2001, HDR 2004). Five to six thousand plants have been documented at these sites from 1983 to 2004. Between 700 and 1,000 of these plants are known to have been destroyed and over 200 others were transplanted from areas scheduled to be destroyed.

Of 142 known sites, as many as 41 sites have been destroyed, the plants have been relocated, or no population information was ever recorded. In addition, plants occurring on at least 118 of the documented sites have not been surveyed since 1993, and plants on 21 of those 118 sites have not been surveyed since 1983.

Utilizing the highest counts recorded for each occurrence of Navasota ladies'-tresses, where plants have been seen in the last ten years and are not known to have been extirpated, the following table summarizes the likely number of extant plants:

County	Number of extant plants	Number of Locations	Plant Numbers per location (highest counts)
Bastrop	3	1	3
Brazos	884	6	35, 70, 99, 100, 100, 480
Fayette	1	1	1
Grimes	1,885	11	3, 9, 12, 23, 31, 31, 216, 227, 229, 330, 774
Jasper	10	1	10
Robertson	21	5	1, 1, 3, 5, 11
Total	2,801	24	

Reasons for Decline and Threats to Survival:

At the time of listing, the primary threat to Navasota ladies'-tresses was destruction or modification of habitat from urbanization, clearing for agricultural production, and mining (47 FR 19539, Service 1984). These factors remain the leading cause of threats to the plants. Newly discovered threats include the destruction of plants by feral pigs (*Sus scrofa*) and grazing of flowering stalks by white-tailed deer (*Odocoileus virginianus*) and rabbits (*Sylvilagus* spp.) (TMPA 2001 and James Thomas, HDR, pers. comm. 2004).

Due to the low numbers of reported individuals, the slow-growing nature of the plants, and their specific habitat requirements, Navasota ladies'-tresses are not regarded as being very resilient. Following disturbance to mature individuals of a population, recovery is estimated to be very slow. Further, transplanting efforts have been largely unsuccessful.

Range-wide Survival and Recovery Needs:

The *Navasota ladies'-tresses Recovery Plan* (Service 1984) (Recovery Plan) requires the establishment and sustainability of two perpetual safe sites through cooperative agreements, purchases, easements, or other means of obtaining management rights, in order to recover the species. Other needs of the species included the development of a baseline set of ecological data from sites where the species currently exists, and development of public awareness, appreciation, and support for protection and recovery of the Navasota ladies'-tresses (Service 1984).

Eleven sites have some degree of protection. Only one of these sites is currently being actively managed for the Navasota ladies'-tresses: a 30-acre (12-hectare) conservation easement in the Indian Lakes residential subdivision south of College Station (100+ plants in 2003). Other protected areas include: (1) the University of Texas Stengl "Lost Pines" Biology Station in Bastrop County; (2) a 71-acre (29-hectare) combination of deed restricted natural area and a conservation easement secured by TxDOT in a residential/commercial development northwest of the SH 40 / SH 6 intersection (35 plants recorded in 1995); (3) an 8-acre (3-hectare) site permanently protected by TxDOT on SH 6 south of College Station (a high count of 1,000 plants in 1993; no plants seen since then); (4) Angelina National Forest in Jasper County; and, (5) Lick Creek Park, College Station, Texas (70 plants in 1986). Additionally, the Texas Municipal Power Agency continues to monitor population numbers at their five safe sites in Grimes County, however, these sites are not protected in perpetuity and could conceivably be lost if ownership of the land changes.

Work on the baseline ecological data has not progressed much since the Recovery Plan although baseline genetics work is currently being conducted by TAMU. A comprehensive baseline set of ecological data of known populations remains a high priority for this species. Additional populations have been found throughout the range of the species; however, most of these are small and isolated. Lack of access to private lands to survey for the plants and lack of analyses on the effects of nearby land use changes inhibit scientific understanding of the species' life history and distribution.

Analysis of the species likely to be affected:

The proposed project would not impact any known Navasota ladies'-tresses, but it would impact 15.18 acres (6.14 hectares) of habitat that is suitable for this species. As delineated by TxDOT, three sites, which are considered marginal quality for habitat totaling 6.70 acres (2.71 hectares), and four sites, which are considered optimal quality for habitat totaling 8.48 acres (3.43 hectares), occur within the project area (Figures 2). The action area is in Leon County, a considerable distance from the "heart of the range" of Navasota ladies'-tresses in Brazos and Grimes counties, where 85 percent of the known occurrences are located.

Drought conditions prevalent from 1997 through 2002 hampered attempts to find Navasota ladies'-tresses, since low moisture conditions may prevent the plants from producing flowering stalks in the fall. Consequently, in order to move the project forward despite Navasota ladies'-tresses not being confirmed by positive identification within the ROW, TxDOT assumes that suitable habitat within the proposed project area contains Navasota ladies'-tresses and will avoid and minimize impacts to this habitat to the extent possible.

Environmental Baseline

The action area for this project includes the proposed roadway, the ROW, and up to 100 feet (30 meters) outside the ROW to account for edge effects. Also included in the action area are the streams and drainages within the aforementioned area. Portions of these streams further than 100 feet downstream of the ROW are not included in the action area, because erosion and sedimentation are anticipated to be minimized by best construction management practices per the Texas Commission on Environmental Quality and the U.S. Army Corps of Engineers guidance.

Status of the species within the action area

Although the status of Navasota ladies'-tresses is unknown because no individuals have been identified within the action area, records show the nearest population of Navasota ladies'-tresses has been found on the Jewett Lignite Mine, approximately 4.5 miles (7.2 kilometers) northwest of the proposed project IH 45 terminus. However, this population was destroyed as a result of mining operations. The next closest population lies in northern Brazos County, approximately 30 miles (48 kilometers) to the south, although plants at this site have not been reconfirmed to still exist since 1983.

It is unclear if the 2003 blooming season survey performed by TxDOT biologists was adequate to determine absence, as Navasota ladies'-tresses blooming is known to be highly variable based on climatic conditions throughout the year, and this species may remain dormant during dry years. From 1997 to 2002, drought conditions were prevalent across this species' range. Although rainfall levels have rebounded in recent years, it is still possible individual Navasota ladies'-tresses may be present but not blooming. Therefore, TxDOT chose to delineate habitat in the project area, assume the habitat is occupied, and that the species may be adversely affected.

TxDOT designated 8.48 acres as optimal habitat within the proposed ROW. Habitat suitability was judged by soil texture, appropriate vegetative cover, canopy density, proximity to drainages, land use practices, and severity of grazing pressure. Areas were judged to have good potential if they had (1) permeable surface soils overlaying an impermeable clay layer, (2) post oak woodlands with sparse canopies or woodland edges, (3) a significant component of native herbaceous vegetation, (4) and proximity to intermittent drainages.

TxDOT designated 6.70 acres as marginal habitat. These areas had the necessary soil and vegetative contexts to support Navasota ladies'-tresses but had been impacted by human activities such as grazing, quarrying, farming, private road construction, home building, and other land use practices.

Factors affecting species environment within the action area

The project is located in the Post Oak Savannah ecological area of Texas, and the Post Oak Woods, Forest, and Grassland Mosaic vegetational area (McMahan, et al. 1984). Gould (1975) describes the Post Oak Savannah area as containing post oak woodlands with an undergrowth of yaupon in the uplands. Upland soils are sandy loams or sands, and bottomlands soils have acid sandy loams to clays (Hatch et al. 1990). Vegetation in the ROW is characterized as including post oak woodlands, grasslands, croplands, developed areas, and wetlands and other waters.

Scattered residences and commercial businesses occur in the rural areas within the project boundaries. The City of Jewett, which had a population of 861 in 2000 (U.S. Census Bureau 2005), is the only city the proposed alignment traverses. Approximately 150 acres of the 170 acres is used for agricultural activities, primarily livestock grazing. Navasota ladies'-tresses are anticipated to be restricted to those areas near intermittent drainages with associated woodland vegetation. The species is generally not found in cleared pasture or maintained residential or business sites.

The human population of Leon County is projected to grow from an estimated 14,879 in 2000 to 24,108 in 2050 (TWDB 2002). According to this same report, Jewett is expected to grow by 72 percent and Buffalo by 61 percent in the same time frame. It is unclear how much growth will occur in the rural areas along the U.S. 79 project corridor.

Effects of the Action

According to the BA, the project will eliminate 15.18 acres of Navasota ladies'-tresses habitat in Leon County, which is near the northern edge of the range of this species. In addition, the proposed project will continue to add to the gradual sustained loss of post oak woodland in the area and to Navasota ladies'-tresses habitat fragmentation. These impacts are likely permanent for Navasota ladies'-tresses due to changes in native vegetation and subsurface hydrology.

Further habitat degradation may be caused by secondary effects associated with increased industrialization and rapid urban growth resulting from economic stimulation (Service 1979). However, these effects are expected to be minimal because development is anticipated to be clustered around the more urban, previously disturbed areas, and most of the ROW has already been converted to grazing land.

TxDOT's proposal to contribute to a conservation fund will likely have a future beneficial effect on the species, regionally, as lands are purchased or protected from alteration through use of these funds.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Destruction of habitat that may occur as a result of the proposed activity was evaluated. Other more indirect cumulative effects are largely unquantifiable. The above examination of activities and trends in the area documents an expected overall increase in activities that result in habitat loss, fragmentation, and degradation. However, this action is on the edge of the species range, not near the center of the distribution in Brazos and Grimes counties, and should not result in a jeopardy situation.

The only known population within 5 miles (8 kilometers) of the action area was at Jewett Lignite Mine, and all Navasota ladies'-tresses there were destroyed. A landfill proposed to begin in 2006 in Grimes County could eliminate 124 plants in the first ten years of operation. Many other sites are fragmented or otherwise impacted by urbanization. Subsequently, habitat loss continues, particularly in the areas of Brazos and Grimes counties where most sites are located.

Conclusion

After reviewing the current status of the Navasota ladies'-tresses, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the Navasota ladies'-tresses. No critical habitat has been designated for the Navasota ladies'-tresses, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

As discussed above, sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act and the implementing regulations prohibit the removal and reduction to possession of federally listed threatened or endangered plants or the malicious damage of endangered plants on areas under federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take Anticipated

The Service does not anticipate the proposed action will incidentally take any listed animal species.

Effect of the Take

No take of any listed animal species is anticipated as a result of this proposed action.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends implementing the following actions:

- Minimize the risk of destruction or harm to Navasota ladies'-tresses plants from direct application of herbicides, herbicide drift into adjacent areas, or through reduction in available pollinators. Avoiding use of herbicides and pesticides in habitats which could potentially support Navasota ladies'-tresses, particularly in wooded areas of the ROW and during time periods when the Navasota ladies'-tresses are above ground would be necessary. In addition, in areas where herbicide use cannot be avoided, direct application techniques should be used to minimize amount of application and the total area of impacted habitat.
- Encourage and participate in additional Navasota ladies'-tresses research and recovery actions. One example is supporting on-going genetic research being conducted by Drs. Jim Manhart and Alan Pepper, Texas A&M University, Biology Department to help genetically differentiate between different *Spiranthes* species and hybrids, and map their true range.

In order for the Austin Ecological Services Field Office to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

Reinitiation Notice

This concludes formal consultation on the proposed widening of a U.S. 79 from Jewett to Buffalo in Leon County Rockdale, Texas. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed

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species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this opinion, please contact Jana Milliken at (512) 490-0057, extension 243.

Sincerely,

Robert T. Pine
Robert T. Pine
Supervisor

cc: Karen Clary, TxDOT Austin, TX
Mike Carpenter, TxDOT, Bryan, TX

Literature Cited

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